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ABSTRACT

Recent research in experimental phonetics seems to provide evidence for a clear division between language units and speech units. Many researchers have suggested that the consonant-vowel (CV) syllable may be a universal unit of speech production and perception, while language units become criterial only at higher levels of processing. In second language learning, the language units and speech units may interfere with one another and produce a disorganized type of speech rhythm. Even before grammar rules and language units are introduced, it would seem profitable to introduce students to the syllabic patterning and rhythmic structure of the target language and to teach them to imitate orally the sounds and rhythms of the target language before they understand the meaning of the utterances. (Author/VM)

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# A SUGGESTED UNIT FOR INTERLINGUAL IDENTIFICATION IN PRONUNCIATION

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## I. Introduction

It has been suggested (Selinker, in press) that a psychology of second language learning must deal with three linguistic systems: a native language (NL), a target language (TL), and an 'interlanguage' (IL). As the learner moves from the system of NL towards the system of TL, he speaks an intermediate "inter-language" -- a system whose shape is determined by NL, TL, and several other factors outlined by Selinker. This interlanguage is constantly changing as it is modified to approximate more closely the target language. The three systems -- NL, IL and TL -- are united psychologically by units of interlingual identification which may occur at various linguistic levels, or which may even be non-linguistic in nature.

## II. Purpose

On the basis of recent research in experimental phonetics, with reference to the nature of speech performance units; and on the basis of my own experience teaching English pronunciation to foreign students at the University of Washington, I would like to hypothesize that:

(1) the CV speech performance unit is a crucial unit of interlingual identification for the second language learner, which influences the shape of the interlanguage phonology. This influence is especially apparent when the learner's linguistic insecurity causes language units and speech units to interfere with one another.

(2) Teachers of remedial pronunciation in the TEFL classroom should therefore make the speech unit more central to

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their approach in teaching a second language, instead of relying so heavily on language units.

III. Background

A. Research in experimental phonetics at present is dealing in part with the nature of speech perception and speech production, and particularly with defining the nature of the most basic units of speech production/perception. It is fairly well agreed by now that language units like the word, the morpheme or the phoneme, which are segmental, discrete and sequential -- are NOT the units we use in actually producing and perceiving the speech signal. While such segmental units may function in higher-level processing, they are not functional in performance. Attempts to find "invariants" in the acoustic signal (Potter, Kopp & Green, 1947; Liberman, 1957) or in the neural signal (Cooper, 1966) which correspond to such sequential linguistic segments on a one-to-one basis have failed. If there are no invariant cues in the acoustic signal which correspond to these segmental units, on what basis do we decode and encode the speech signal? What are the invariant cues we actually use in the perception and production of speech? Almost all recent research seems to point in answer to the syllable as it occurs in rhythmic groups or programs of about seven (plus or minus two) -- that is, to the syllable within a "tone group"(Halliday, 1967), a "phonemic clause" (Trager & Smith, 1951), a "breath group" (Lieberman, 1967), or a "syntagma" (Kozhevnikov & Chistovich, 1965).

B. Kozhevnikov and Chistovich (K&C) have carefully measured muscle movements and muscle ennervation during speech. Their investigations have led them to posit the existence of a universal unit of speech production and perception -- the CV syllable (and its elaborated forms, such as CCV, CCCV) as it occurs within the syntagma. They define a

syntagma as a grouping of about seven syllables which is both a unit of meaning and an articulatory unit. K&C claim that, in speech production, each set of neural instructions appears to correspond to the program of articulatory movements of one syntagma; one neural signal to the articulators corresponds to one syllable unit, indicating simultaneously the consonant and vowel phonemes. The rhythmic organization of the syntagma thus provides the sought-for invariant:

> ... if we examine the syntagma as a sequence of sounds of speech, we cannot find any constancy in its time figure. However, if we turn to the syllables and consider the syntagma as a sequence of syllables, its rhythmic figure is an invariant ... (K&C, p. 89)

In describing speech perception, K&C claim that the units of linguistic decision correspond to phonemes, but that the sector of speech flow on the basis of which that decision is made, corresponds to the syllable -- not to language units like phonemes or distinctive features. (K&C, p. 215) There is a clear division in the work of K&C between the domains of language units and of speech units. For example, they emphasize that the syllable division usually accepted by linguists is NOT the same as that which they claim operates at the articulatory/perceptual level.

> ... the articulatory program of man is constructed according to a type of open syllables with any consonant after a vowel designating the beginning of the next syllable group ... (K&C, p. 140)

A basic CV syllable pattern may be elaborated into units of CCV or CCCV in different languages; yet in elaborated syllables as well as simple ones, the entire combination is assigned simultaneously as a package of instructions to the effector centers -- the open syllable behaves as a unit.

C. Under conditions of stress (i.e., delayed auditory feedback), K&C

find that elaborated syllables tend to break down into elementary syllables of the CV type. For example, if the "target" was aCCV pattern, the subjects would insert a neutral vowel /ə/ between the consonants to obtain a CxCV pattern. K&C speculate that the attempt was always to preserve the unitary CV pattern; the CV syllable was not broken down further into phonemes or distinctive features or other language units.

CVC = CV + Cə  CCV = Cə + CV  CVCC = CV + Cə + Cə

So, for example, "polotno" (linen) became "po-lo-tə-no", and "pismo" (letter) became "pi-sə-mo." K&C postulate on the basis of observations such as these that the CV syllable may be the basic, unitary articulatory unit of man.

D. At the same time, they do not deny the utility of language units. K&C maintain, for example, that the underlying linguistic unit may be the phoneme. This unit is important at a "logical" level, but is realized differentially in the NONLINGUISTIC production unit of the open syllable (K&C, p. 154).

E. Other researchers have reached similar conclusions using very different techniques of analysis. Fromkin (1968) offers electromyographic evidence in support of the syllable as the smallest invariant neural unit; Boomer & Laver (1968) find evidence in investigating slips of the tongue, that such slips are syllabic and not phonemic. (for example)

> ... the brain obviously transmits different neural commands for a phoneme occurring in initial as opposed to final syllable position, and one hypothesis which could explain this is that the syllable constitutes the basic neural unit. (Laver, 1970, p. 71)

> ... it is at least plausible ... that syllabification is one feature of the brain's control of motor speech activity, and that the true function of the syllable ... is to form the unit of neural organization. (Fry, 1964, p. 219)

F. In the attempt to conceptualize the complex process of speech perception, several researchers [notably Neisser (1966) and Kintsch (1970)] have proposed models of speech performance which attempt to relate linguistic "rules", speech performance units, and the acoustic signal. Obviously, such models must be incomplete and contradictory at this stage of research. Nevertheless, the following emerging characteristics seem to be consistently supported by the available data:

(1) At least two types of retention appear to be involved in speech perception -- short-term memory and long-term memory.

(2) In a pre-attentive stage, there is short-term preservation of the auditory information in unsegmented form, in "echoic storage". Unless the information in echoic storage is attended to, it is rapidly and permanently lost. Up to and including the stage of echoic storage, the speech signal is not processed linguistically; it is modified by sensory and motor variables only. Hence, it is probable that production units or performance units are crucial up to this point; as we have seen, the syllable as part of a group of about seven syllables, rhythmically organized, is the most likely speech performance unit.

(3) Processing <u>after</u> the echoic storage stage is in segmental, discrete, sequential linguistic units -- words, morphemes, phonemes, phones, features, etc. Language units are appropriate to the underlying level of speech production/perception; performance units are appropriate to the surface levels of speech production/perception.

(4) In the second stage of speech perception, information is processed linguistically. A preliminary analysis appears to be able to select out of echoic storage, perhaps on the basis of rhythmic structure, enough meaningful features to enable us to construct hypotheses as to

the linguistic structure of the perceived utterance. The exact nature of this higher-level linguistic processing is still a matter of some controversy.

IV. Implications for Second Language Learning

A. A crucial process influencing the shape of the IL phonology may be a form of linguistic insecurity[1] which results in a disorganization and disturbance of this archetypal production/perception unit of speech -- a disturbance which may be very similar to the behavior described by K&C for native speakers subjected to delayed auditory feedback. Second language learners can quite easily be considered linguistically insecure. They usually have some knowledge of the language rules of the second language; in addition, since many learn a second language by reading and writing, their knowledge would appear to be limited to the segmental, discrete and sequential sorts of language units. As they move into unfamiliar speaking situations, they may "hypercorrect" their speech. The second-language learner would seem to constantly check his speech performance against what he "KNOWS" the language rules to be. He may attempt to preserve the segmental nature of the LANGUAGE units in his motor PERFORMANCE; yet (a la K&C) he may also tend to be producing speech in CV speech units. His "correction" of the units of production towards the segmental units of language which he "KNOWS" about, would then result in an IL phonology where language

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[1] In another context, William Labov (1966) describes a phenomenon which he calls "linguistic insecurity"; it occurs when speakers move into new social situations for which they do not have adequate speaking skills. Speakers who are linguistically insecure resort to what Labov calls "hypercorrect" language behavior -- a tendency to adhere too closely to what they KNOW the "correct grammar rules" to be. In New York City, for example, many speakers do not normally pronounce postvocalic "r" (e.g. "cah" for CAR, "Lincoln Centeh" for LINCOLN CENTER). In formal situations, such speakers may become linguistically insecure, and, knowing that they need to add /r/ to final vowels in some words, may add /r/ to final vowels inappropriately -- as in "Cuber" for CUBA.

A similar phenomenon in second language learning has been described by Selinker ( ) who refers to "fossilized" IL forms, which tend to crop up in the speech of otherwise proficient $L_2$ learners in stressful situations (as when giving a seminar presentation).

units and speech performance units interfere with one another[2] to produce a disorganized type of speech behavior. The conscious knowledge of language rules and language units could cause the learner to attempt to preserve the language units in his performance; yet the postulated necessity of the articulators to operate in CV programs could simultaneously cause the sort of disorganization of rhythm which has often been noted by perceptive teachers of pronunciation in the TEFL classroom. Teachers and text-book writers have referred to this as "unnatural speech rhythm", "insertion of /ə/", "insertion of glottal stops", "failure to blend sounds across word boundaries", or "reading pronunciation."

B. Clifford Prator (1955), for example, in his chapter on blending sounds across word boundaries, points out clearly that:

> Within thought groups, words and syllables [Prator uses the linguists' definition of syllable here] are not pronounced as separate units; they flow along smoothly, without jerkiness, and one seems to blend into the next. A person who did not know any English would find it hard to tell where one word ended and another began. The blending between the two words of read it is as close as that between the two syllables of reading. ... Those who are learning English as a second language often spoil the blending within thought groups by inserting little puffs of air of /ə/ sounds in order to divide combinations of consonants which seem difficult to them: I don't think so. /aɪ donta θɪŋkə so/. ... Blending may also be spoiled by making glottal stops.
> (Prator, pp. 30-1)

Prator's insight into the importance of what he called "blending" led him to emphasize the importance of teaching speech rhythm and "word-blending" in his book; he devotes an entire (very helpful) lesson to the topic.

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[2]To my knowledge, this sort of interference in second language learning has not been reported before. Interference from the native language or from the target language is commonly reported; however, an interference between speech performance units and language units has been hitherto unreported.

C. My observation of pronunciation patterns used by second language learners in a TEFL classroom supports the observations cited by Prator above. For example, for the word "stray", where a native speaker might say /stre:/, a Thai student was almost unintelligible in his rendition: /sətəre:/.
In attempting to read a drill from Prator's book, for the sentence, "Give a man a pipe he can smoke," a student from Taiwan absolutely refused to believe that it was "correct pronunciation" when Americans said:

/gɪ-vθ-mæ-nə-paɪ-pi-kə̃-nsmo-kʰ/ rather than

/gɪ-vʰ-ə-mæ-nʰ-ə-paɪ-pʰ-hi-kæ-nə-sə-mo-kʰ/

Notice here that the native speaker of the TL in his production uses open syllables which do not necessarily coincide with word boundaries. Where syllable units extend across word boundaries, he "blends" the sounds together in his production. The speaker operating in IL avoids this "blending" because he attempts to produce the language units he has been taught. In his hypercorrection, he attempts to preserve the boundaries of the language units by inserting neutral vowels /ə/ or "neutral" consonants /ʔ/.

D. One cannot help observing at this point the similarity between the performance of the second language learner in IL, and the performance of K&C's native speakers with delayed auditory feedback. Notice that the CCCV "elaborated" syllable /stre:/ is broken down in IL to CV syllables, just as in K&C's delayed auditory feedback experiment -- by the insertion of /ə/ to create a CV pattern. Both types of speakers are under stress in their speaking situations, and both would seem to "revert" to the postulated basic CV speech unit.[3]

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[3]A plausible test of the "CV hypothesis" is suggested here; it might entail an examination of the language behavior of second language learners whose NL contains "elaborated" CCV or CCCV syllables. Do such learners tend to "revert" to CV syllabic production patterns in the same way that Thai or Chinese students do? Do French learners of English fail to "blend" across language unit boundaries, even though such blending occurs in their own NL?

V. Implications for Second Language Teaching

A. Since we've claimed that it is conscious knowledge of TL linguistic rules which interferes with the natural syllabic production units, perhaps a conscious knowledge of the rules of speech production -- the universal realizational nature of the CV syllable unit -- could help the student. Clifford Prator's insightful chapter on sentence stress and rhythm makes good use of this approach. Conscious attempts by students to "blend" open syllable combinations across word boundaries do seem to improve IL speech performance. Observation in my own classroom indicates that once second language learners are made consciously aware that American speakers DO NOT in fact "speak in language units" -- that they DO "blend" across word boundaries and "run their words together" in certain contexts -- they have been able to modify their own performance in that direction quite noticeably, thereby improving intelligibility. Drills, tapes and other practice techniques which deal with rhythm and "blending" have been quite helpful. (Examples of such drills may be found in Lesson Four of Prator's book.)

B. Emphasis on the conscious knowledge of the rules of speech production, and drills which emphasize this area, should occur <u>early</u> in the teaching of pronunciation. Once faulty patterns of rhythm have been learned, they become almost impossible to unlearn. They become so much a matter of unconscious habit that they can influence the perceptions of the second language learner to an astonishing extent (e.g., the student from Taiwan who refused to "believe his ears").

C. The suggested importance of the syllabic patterning of the TL would seem to encourage experimentation in ways of teaching students to produce such patterning before any interference from language units can occur. Even before grammar rules and language units are introduced, it would seem profitable to

introduce students to the rhythmic structure of the TL -- to teach them to imitate orally the sounds and rhythms of the TL even before they understand the meaning of the utterances. Prator even suggests that TEFL students attempt to imitate an "American accent" in their NL -- in essence, to transfer American English rhythm, syllabic patterning and intonation to more familiar language units.

Cherry (1966) has experimented with a technique called "shadowing" (with native speakers -- not with second language learners) -- in which a subject mimics a model syllable-by-syllable, so that both are speaking almost simultaneously. Theoretically, this procedure should not allow even native speakers time to process linguistically; articulatory habits alone govern the utterance. For more advanced second language learners -- those who have mastered much of the linguistic system of TL -- this technique might be used in an attempt to "bypass" their knowledge of TL language units, and give the learners practice in the syllabic patterning of TL.

VI. Conclusion

A. Recent research in experimental phonetics seems to provide evidence for a clear division between language units and speech units. Many researchers have suggested that the CV syllable may be a universal unit of speech production and perception, while language units become criterial only at higher levels of processing.

B. I have hypothesized that in second language learning, a crucial process influencing the shape of interlanguage phonology is a linguistic insecurity which causes language units and speech units to interfere with one another, producing a disorganized type of speech rhythm which has often been described by TEFL teachers of pronunciation.

C. The CV speech performance unit thus becomes a crucial unit of interlingual identification for the second language learner, and should be dealt with as such by TEFL teachers.

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